OIPE
MAY 0 5 2004
PATENT & TRADEMARK OFFICE

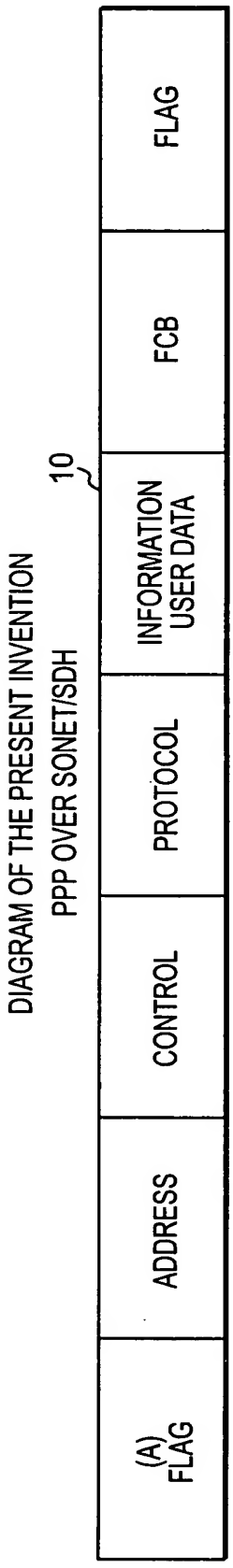

FIG. 1(A)

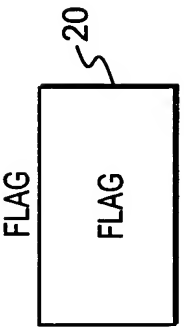

FIG. 1(B)

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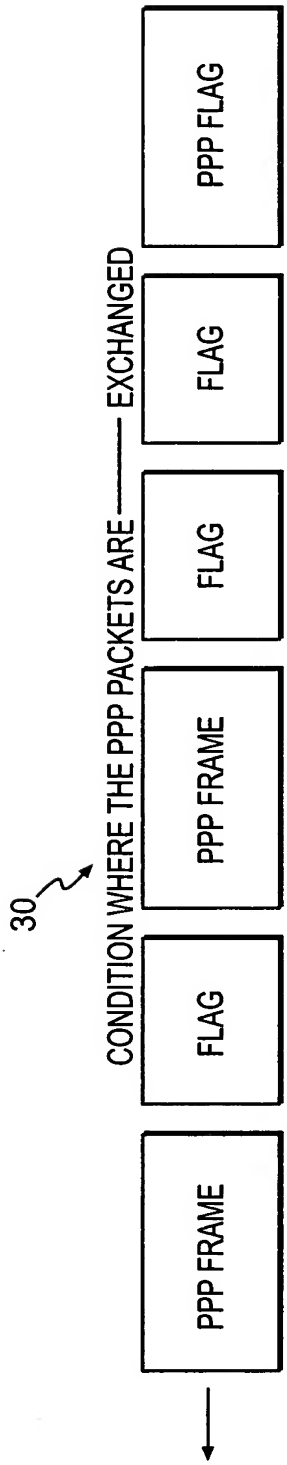

FIG. 1(C)

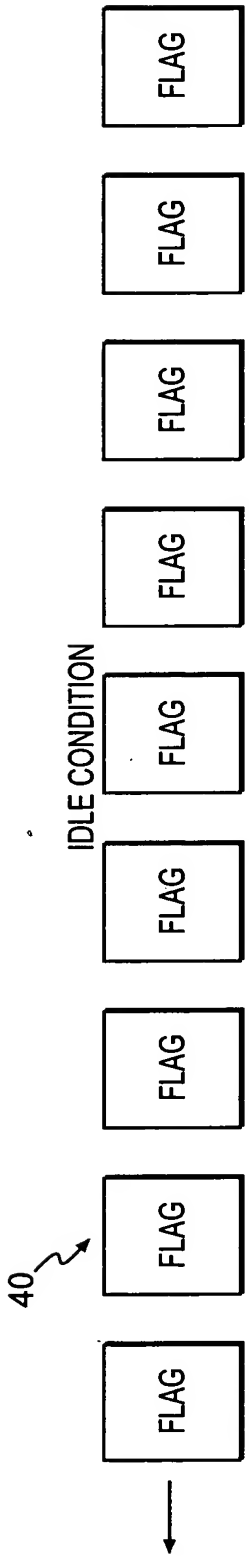

FIG. 1(D)

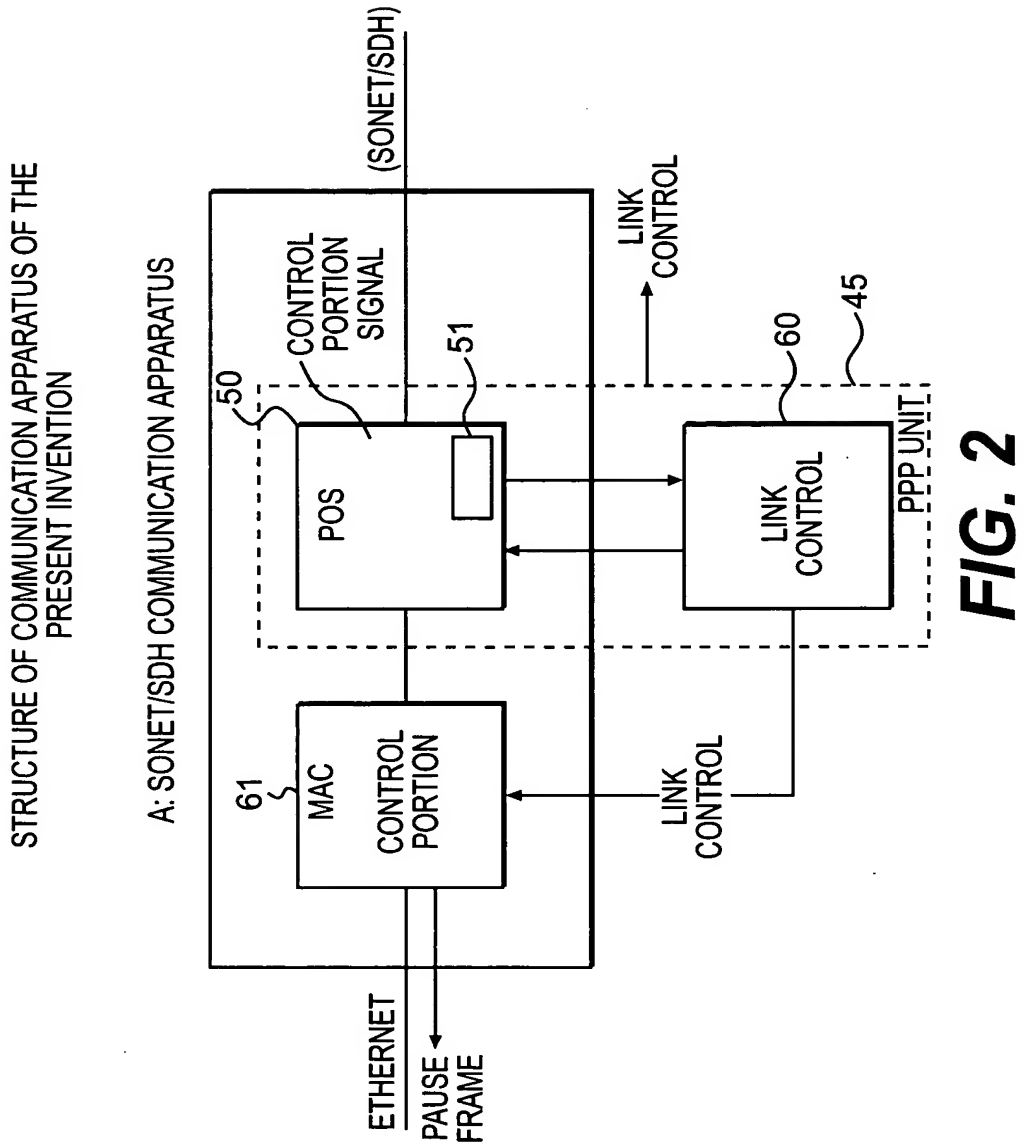
STRUCTURE OF COMMUNICATION APPARATUS OF THE PRESENT INVENTION
A: SONET/SDH COMMUNICATION APPARATUS
(SONET/SDH)
50
CONTROL PORTION SIGNAL
51
POS
LINK CONTROL
60
45
LINK CONTROL
PPP UNIT
61
MAC CONTROL PORTION
LINK CONTROL
ETHERNET
PAUSE FRAME

FIG. 2

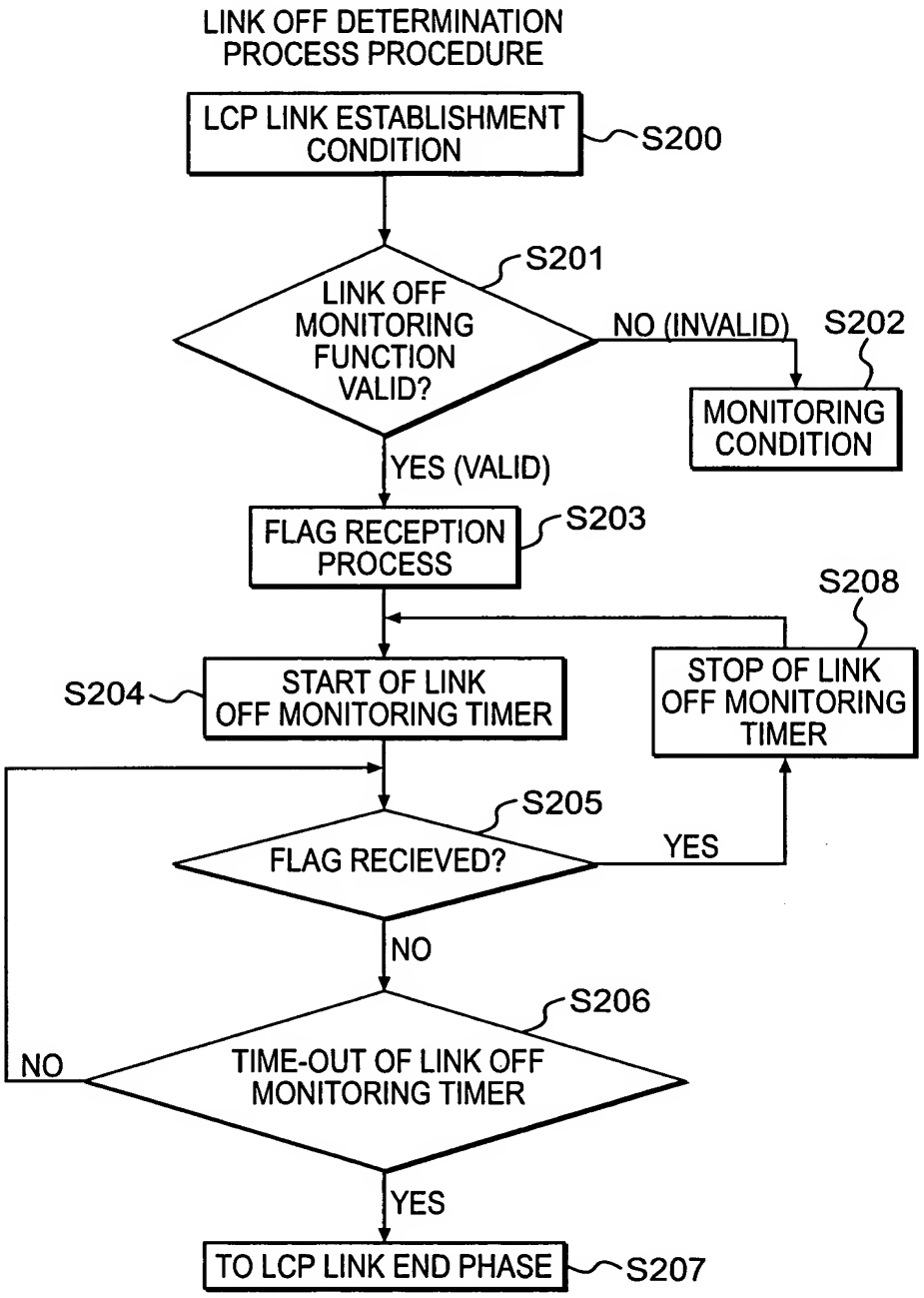
LINK OFF DETERMINATION PROCESS PROCEDURE
LCP LINK ESTABLISHMENT CONDITION
S200
S201
LINK OFF MONITORING FUNCTION VALID?
NO (INVALID)
S202
MONITORING CONDITION
YES (VALID)
FLAG RECEPTION PROCESS
S203
S208
S204
START OF LINK OFF MONITORING TIMER
STOP OF LINK OFF MONITORING TIMER
S205
FLAG RECIEVED?
YES
NO
S206
NO
TIME-OUT OF LINK OFF MONITORING TIMER
YES
TO LCP LINK END PHASE
S207

FIG. 3

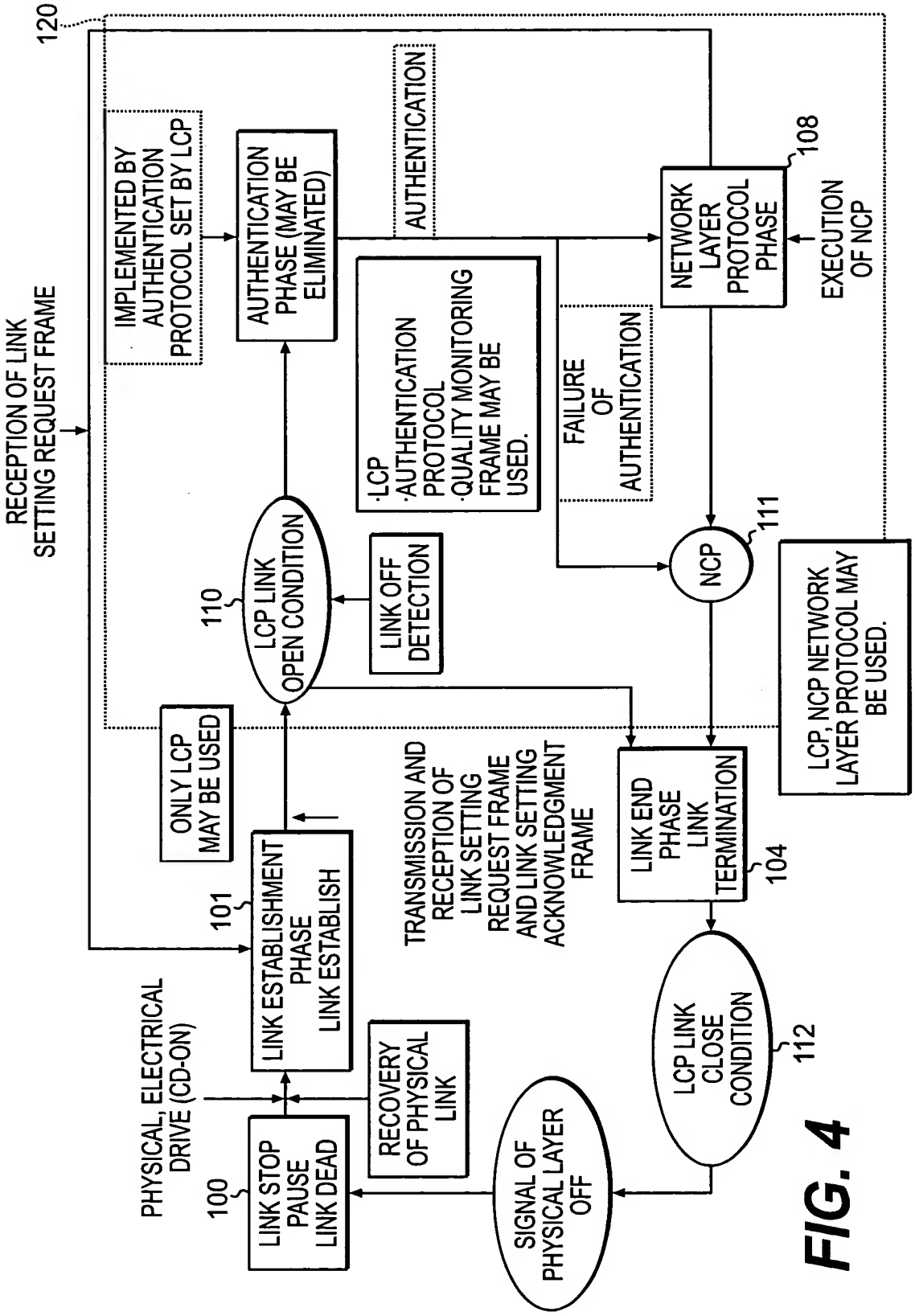
120
RECEPTION OF LINK SETTING REQUEST FRAME
IMPLEMENTED BY AUTHENTICATION PROTOCOL SET BY LCP
AUTHENTICATION PHASE (MAY BE ELIMINATED)
AUTHENTICATION
NETWORK LAYER PROTOCOL PHASE
108
EXECUTION OF NCP
·LCP
·AUTHENTICATION PROTOCOL
·QUALITY MONITORING FRAME MAY BE USED.
FAILURE OF AUTHENTICATION
NCP
111
110
LCP LINK OPEN CONDITION
LINK OFF DETECTION
ONLY LCP MAY BE USED
LCP, NCP NETWORK LAYER PROTOCOL MAY BE USED.
TRANSMISSION AND RECEPTION OF LINK SETTING REQUEST FRAME AND LINK SETTING ACKNOWLEDGMENT FRAME
LINK END PHASE LINK TERMINATION
104
101
LINK ESTABLISHMENT PHASE LINK ESTABLISH
PHYSICAL, ELECTRICAL DRIVE (CD-ON)
RECOVERY OF PHYSICAL LINK
LCP LINK CLOSE CONDITION
112
100
LINK STOP PAUSE LINK DEAD
SIGNAL OF PHYSICAL LAYER OFF

FIG. 4

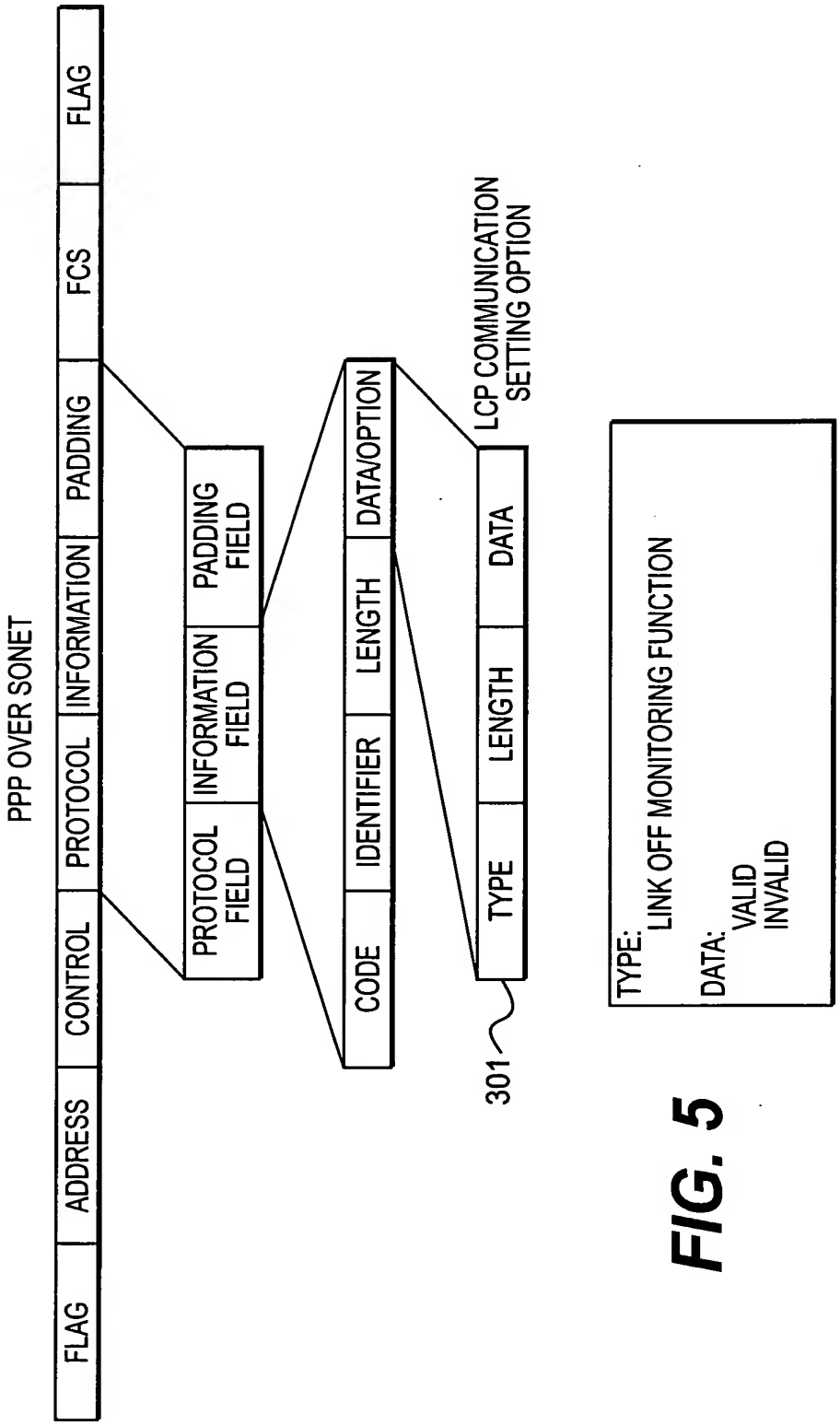
PPP OVER SONET
FLAG
ADDRESS
CONTROL
PROTOCOL
INFORMATION
PADDING
FCS
FLAG
PROTOCOL FIELD
INFORMATION FIELD
PADDING FIELD
CODE
IDENTIFIER
LENGTH
DATA/OPTION
TYPE
LENGTH
DATA
LCP COMMUNICATION SETTING OPTION
301
TYPE:
LINK OFF MONITORING FUNCTION
DATA:
VALID
INVALID

FIG. 5

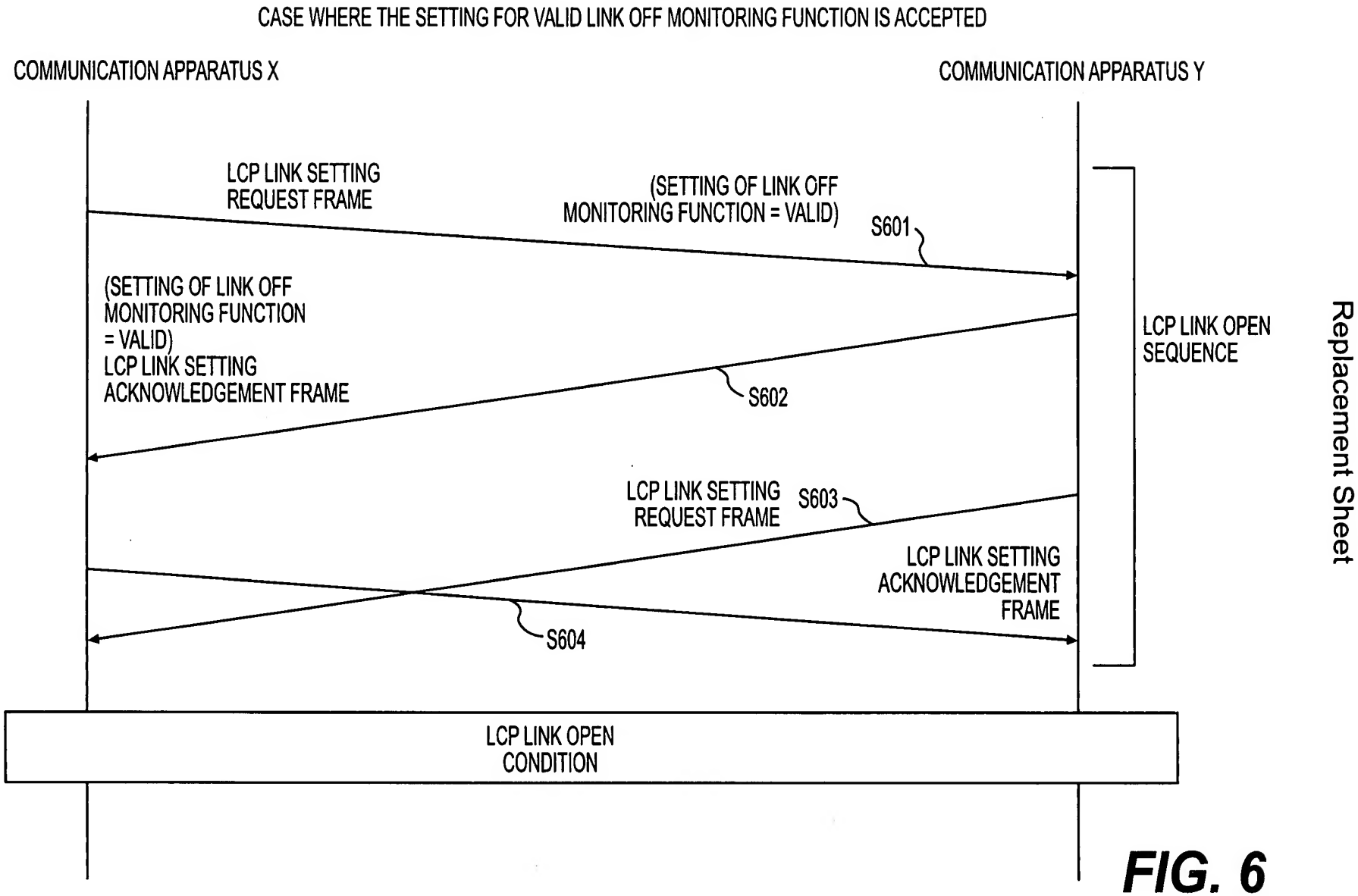

FIG. 6

Replacement Sheet

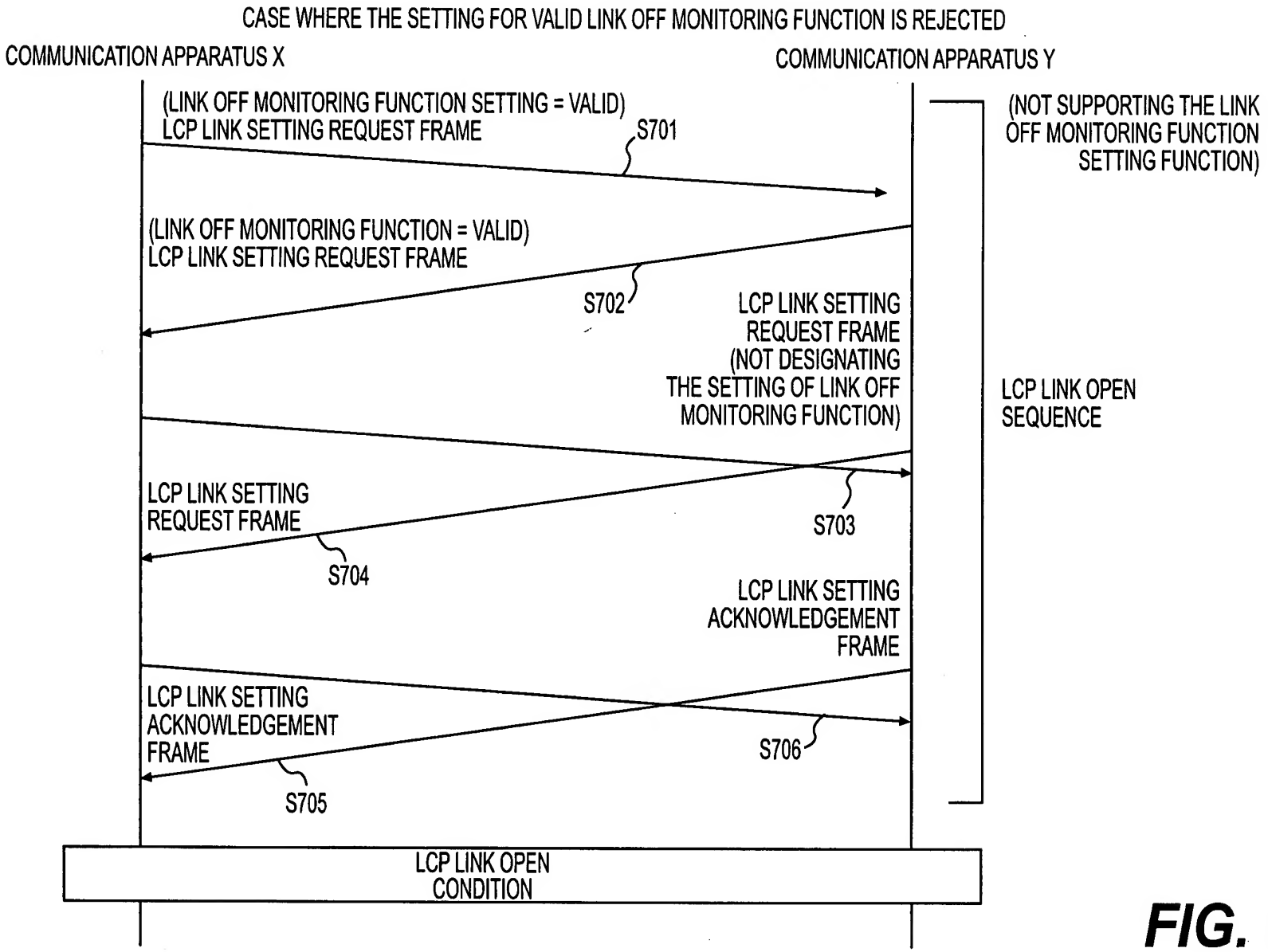

FIG. 7

Replacement Sheet

PAUSE FRAME FORMAT

PREAMBLE	SFD	DESTINATION ADDRESS	TRANSMISSION SOURCE ADDRESS	LENGTH/ TYPE	MANIPULATION CODE	INTERMISSION TIME	PADDING	FCS
7	1	6	6	2	2	2	42	4(OCTET)

INTERMISSION TIME
(TRANSMISSION OF MAC FRAME
IS INTERMITTED ONLY FOR THE
TIME (DESIGNATED INTERMISSION
TIME X 512 BITS)
512 BITS MEANS THE TIME
REQUIRED FOR TRANSMISSION
OF 512 BITS IN THE DESIRED
TRANSMISSION RATE.
SINCE 51.2 μSEC for 10 BASE - ※ (10MBPS)
5.12 μSEC for 100 BASE - ※ (100MBPS)
512 μSEC for 1000 BASE - ※ (1GBPS)
AND THE MAXIMUM VALUE OF THE INTERMISSION TIME
IS 65.535, FOLLOWING INTERMISSION TIMES MAY BE
DESIGNATED:
0~0.33 SEC FOR 10 BASE - ※ (10MBPS)
0~330 μSEC FOR 100 BASE - ※ (100MBPS)
0~33 μSEC FOR 1000 BASE - ※ (1GBPS)
HERE INTERMISSION TIME = 0 IS USED TO INSTRUCT
THE RE-START OF THE TRANSMISSION.

FIG. 8

Replacement Sheet

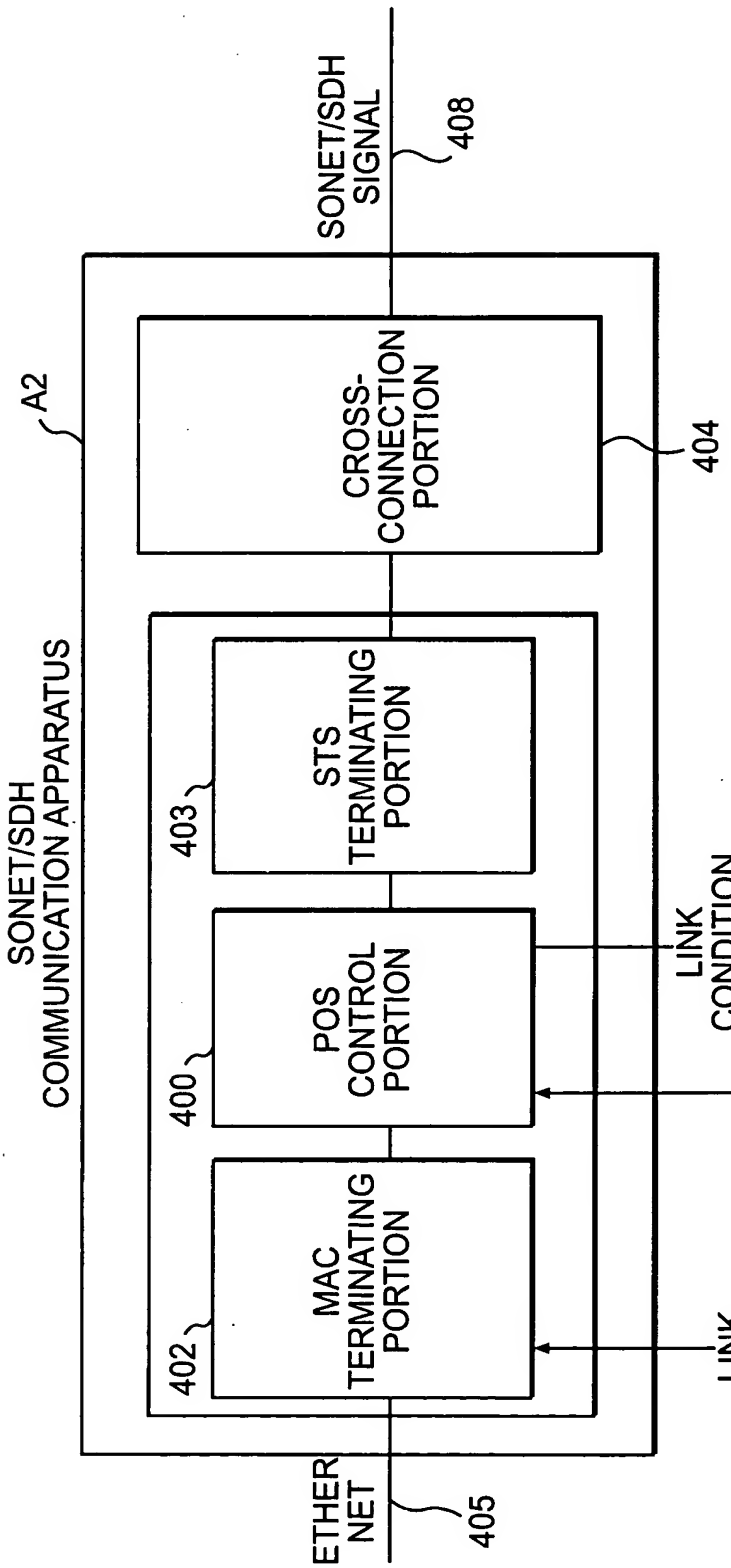
SONET/SDH COMMUNICATION APPARATUS
A2
SONET/SDH SIGNAL
408
CROSS-CONNECTION PORTION
404
STS TERMINATING PORTION
403
POS CONTROL PORTION
400
MAC TERMINATING PORTION
402
LINK CONDITION
FIRMWARE (LINK CONTROL PORTION)
401
LINK CONDITION
ETHER NET
405

FIG. 9

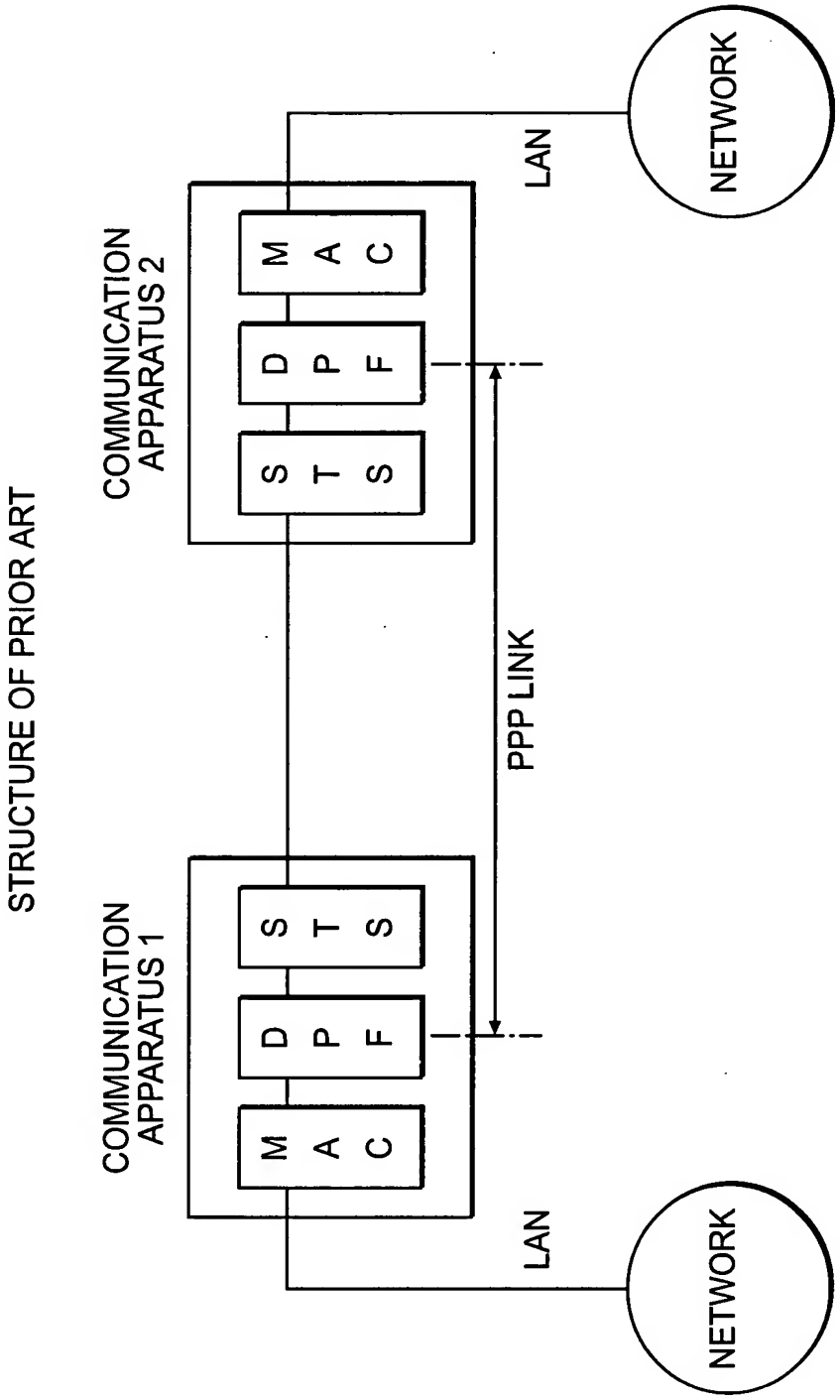
STRUCTURE OF PRIOR ART
COMMUNICATION APPARATUS 1
COMMUNICATION APPARATUS 2
MAC
DPF
STS
PPP LINK
LAN
LAN
NETWORK
NETWORK

FIG. 10

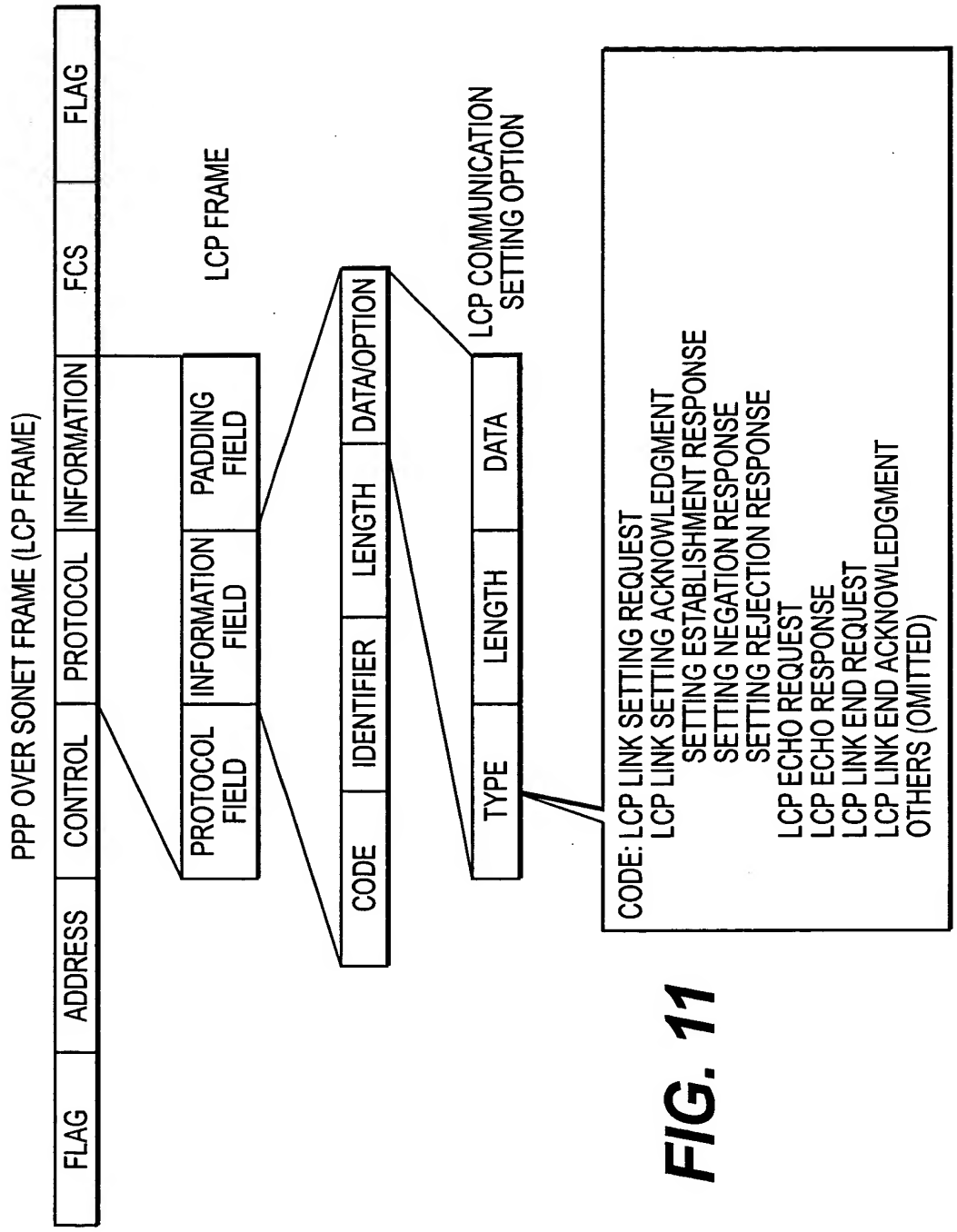
PPP OVER SONET FRAME (LCP FRAME)
FLAG
ADDRESS
CONTROL
PROTOCOL
INFORMATION
FCS
FLAG
LCP FRAME
PROTOCOL FIELD
INFORMATION FIELD
PADDING FIELD
CODE
IDENTIFIER
LENGTH
DATA/OPTION
LCP COMMUNICATION SETTING OPTION
TYPE
LENGTH
DATA
CODE: LCP LINK SETTING REQUEST
LCP LINK SETTING ACKNOWLEDGMENT
SETTING ESTABLISHMENT RESPONSE
SETTING NEGATION RESPONSE
SETTING REJECTION RESPONSE
LCP ECHO REQUEST
LCP ECHO RESPONSE
LCP LINK END REQUEST
LCP LINK END ACKNOWLEDGMENT
OTHERS (OMITTED)

FIG. 11

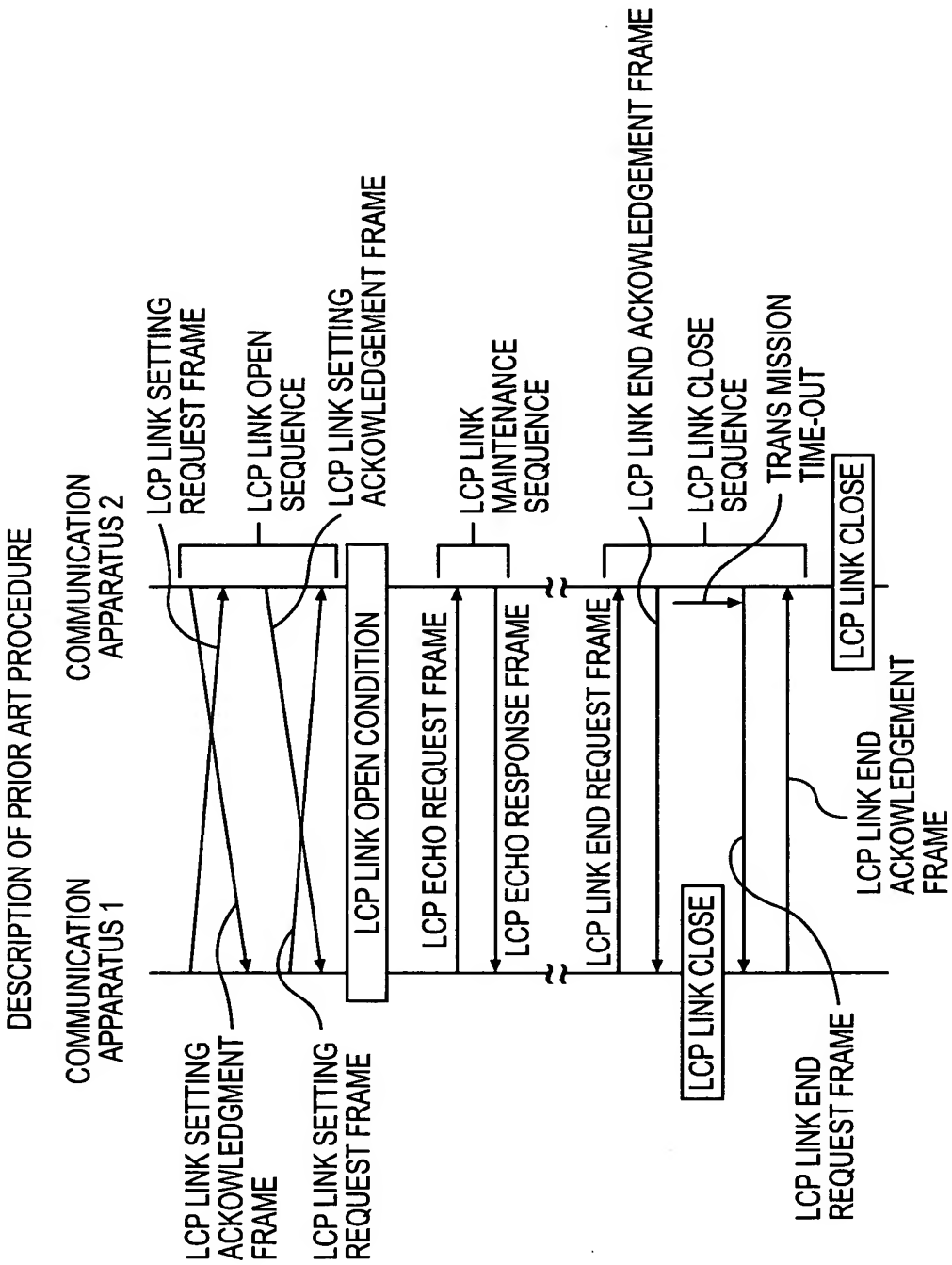
DESCRIPTION OF PRIOR ART PROCEDURE
COMMUNICATION APPARATUS 1
COMMUNICATION APPARATUS 2
LCP LINK SETTING REQUEST FRAME
LCP LINK OPEN SEQUENCE
LCP LINK SETTING ACKOWLEDGEMENT FRAME
LCP LINK MAINTENANCE SEQUENCE
LCP LINK END ACKOWLEDGEMENT FRAME
LCP LINK CLOSE SEQUENCE
TRANS MISSION TIME-OUT
LCP LINK CLOSE
LCP LINK SETTING ACKOWLEDGMENT FRAME
LCP LINK SETTING REQUEST FRAME
LCP LINK OPEN CONDITION
LCP ECHO REQUEST FRAME
LCP ECHO RESPONSE FRAME
LCP LINK END REQUEST FRAME
LCP LINK CLOSE
LCP LINK END ACKOWLEDGEMENT FRAME
LCP LINK END REQUEST FRAME

FIG. 12